

### Claims:

1. A substantially pure preparation of an Aiolos polypeptide having the following properties.

(a) it can form a dimer with an Aiolos or Ikaros polypeptide;

(b) it is expressed in committed lymphoid progenitors;

(c) it is expressed in committed T and B cells;

(d) it has a molecular weight of approximately 58 kD;

(e) it has at least one zinc finger domain;

(f) it is not expressed in stem cells; and

(g) it is a transcriptional activator of a lymphoid gene.

2. A fragment of the protein of claim 1 at least 50 amino acids in length.

3. An anti Aiolos antibody.

4. A substantially pure nucleic acid comprising, a nucleotide sequence which encodes an Aiolos polypeptide.

5. A vector comprising a DNA sequence encoding an Aiolos peptide.

6. A cell containing the purified DNA of claim 4.

7. A method for manufacture of an Aiolos peptide comprising culturing the cell of claim 6 in a medium to express said Aiolos peptide.

8. A method of making an Aiolos polypeptide, having at least one biological activity of a naturally occurring Aiolos polypeptide, including altering the sequence, of one or more residues and testing the altered polypeptide for the desired activity.

9. A method for treating an animal for a disorder comprising administering a therapeutically-effective amount of an Aiolos polypeptide, a cell selected for the expression of a product of the Aiolos gene, or a nucleic acid encoding an Aiolos peptide to the animal.

10. A method for determining if a subject is at risk for a disorder related to mis-expression of the Aiolos gene comprising examining the subject for the expression

or structure of the Aiolos gene, non-wildtype structure or expression being indicative of risk.

11. A transgenic animal having an Aiolos transgene.

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12. A substantially pure dimer which includes an Aiolos polypeptide and an Ikaros polypeptide.

13. A method of providing a proliferation-deregulated cell, or a cell which  
10 has non-wild type antibody production comprising causing a subject cell to misexpress  
the Aiolos gene, thereby providing a proliferation-deregulated or antibody  
overexpressing cell.

14. A proliferation-deregulated hematopoietic cell which misexpresses Aiolos.  
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15. A method of culturing an Aiolos-misexpressing cell having at least one  
mutant allele at the Aiolos locus comprising introducing the cell into a mammal and  
culturing the cell.

20 16. A method of reconstituting an immune system comprising supplying a  
recipient mammal, and introducing into the recipient mammal, an immune system  
component from a donor mammal, which is Aiolos misexpressing.

25 17. A reaction mixture including an immune system component, the  
component including cells which misexpress Aiolos or being from an animal or cell  
culture which is misexpresses Aiolos or which carries at least one mutant allele at the  
Aiolos locus, and a target tissue or cell.

30 18. A method of providing an antibody, comprising:  
providing a mammal having a cell which is Aiolos deregulated; and  
isolating an antibody from the animal or from a cell derived from the  
animal.

35 19. The method of claim 18, the mammal is a mouse

20. The method of claim 18, wherein the mammal is an Aiolos transgenic  
mouse.

*Sub C2*  
21. The method of claim 18, wherein the antibody is directed to an autoantigen.

*Sub C3*  
5 22. The method of claim 18, wherein the mammal is immunized with an antigen.

*Sub C2*  
10 23. The method of claim 18, wherein the antigen is poorly antigenic in wild type animals.

*Sub C4*  
15 24. The method of claim 18, wherein **the antigen has at least 90% homology between the first and second species**, wherein the first species is the animal which provides the antibody and the second species is the species which provides the antigen.

15 25. The method of claim 18, wherein **the antibody is an IgG antibody**.

26. The method of claim 18, the mammal carries homozygous null mutations at the Aiolos gene.

*Sub C5*  
20 27. The method of claim 18, the method further comprises isolating one or more cells from the mammal and isolating the antibody therefrom.

25 28. The method of claim 18, a cell from the animal is fused with a second cell to provide a hybridoma and the antibody is isolated from the hybridoma.

*Sub C6*  
30 29. A method of providing an antibody comprising:  
providing a mouse having a cell which is homozygous for null or underexpressing mutations at the Aiolos locus; and  
isolating an antibody from the animal.

30. The method of claim 29, wherein the mouse is an Aiolos transgenic mouse.

*Sub C6*  
35 31. The method of claim 29, wherein the antibody is directed to an autoantigen.

32. The method of claim 29, wherein the mammal is immunized with an antigen.

33. The method of claim 29, wherein the antigen is poorly antigenic in wild type animals.

34. The method of claim 29, wherein the antigen has at least 90% homology between the first and second species, wherein the first species is the animal which provides the antibody and the second species is the species which provides the antigen.

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35. A method of providing a monoclonal antibody, comprising: providing a mouse having a cell which is homozygous for null or underexpressing mutations at the Aiolos locus; isolating a cell from the animal; and isolating an antibody from the cell or a derivative of the cell

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36. The method of claim 35, wherein the derivative is a hybridoma.

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37. The method of claim 35, wherein the cell is a lymphocyte.

38. The method of claim 35, wherein the mouse is an Aiolos transgenic mouse.

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39. The method of claim 35, wherein the antibody is directed to an autoantigen.

40. The method of claim 35, wherein the mammal is immunized with an antigen.

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41. The method of claim 35, wherein the antigen is poorly antigenic in wild type animals.

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42. A preparation of an antibody produced by an Aiolos mutant animal or cell.

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Abstract of the Disclosure

An Aiolos protein.

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